

## **Report for 2003PA13B: Water Conservation Training and Public Education**

- Other Publications:

- Sharpe, W.E., and B.R. Swistock. 2004. Household Water Conservation. College of Agric. Sci., Agric. Res. and Coop. Extension, Penn State University, 8p.

Report Follows

**Abstract:**

Serious droughts and increasing competition for water have exacerbated water use disputes in Pennsylvania in recent years. Recently passed water use legislation in the state has focused on water conservation as an important tool for future management of the states water supplies. The Cooperative Extension system provides an attractive vehicle to disseminate water conservation education throughout Pennsylvania. This project provided tools and training to increase public knowledge of water conservation and water use issues through education programs delivered by trained Cooperative Extension educators. A two-day workshop on water conservation was delivered to 25 Extension educators from Pennsylvania in October 2003. The program included speakers from Pennsylvania and California with presentations on drought, water use, home water conservation, youth water conservation education, landscape water conservation, water re-use, agricultural water management, river basin water management, and western water conservation experiences. Each attendee received a binder with written background materials. A new publication was also developed entitled "Household Water Conservation" and 5,000 copies were printed for distribution by Extension educators throughout Pennsylvania. A water conservation web page was also developed to house this publication and other fact sheets related to water conservation. A water conservation PowerPoint was also created and is available on the web page. Finally, ten water conservation table-top displays were created and distributed throughout the state for use by Extension educators. Impacts of this training and the new resources will be measured over the coming years through the Extension web reporting system.

**Statement of Critical Water Problem:**

Serious droughts have occurred in six out of the last ten years in Pennsylvania. Falling groundwater and stream levels have impacted both community water suppliers and rural homes using private water systems. State-imposed water use restrictions have been imposed in many counties as an emergency measure to conserve water supplies and in extreme situations water conservation measures were mandatory. State government requests for water conservation are usually satisfied through temporary changes in water use habits, such as bans on outdoor water use. These changes in habit, while effective in reducing water use, provide little long-term benefit.

In addition to drought concerns, increasing competition for water in traditionally rural areas has exacerbated water use disputes. These problems along with persistent droughts lead to the passage of legislation (Act 220) in December 2002 to promote water conservation and management of the Commonwealth's water resources. This legislation recognizes that water conservation education is necessary to deal with future water supply and demand in Pennsylvania.

Unfortunately, there is little specific information or education available to the public on comprehensive, long-term water conservation measures. The Cooperative Extension system provides an attractive vehicle to disseminate water conservation education throughout Pennsylvania. Extension agents utilize a combination of professional training and written and electronic resources to disseminate educational programs to citizens throughout Pennsylvania. In many counties, Cooperative Extension agents also serve on mandatory drought task forces that

provide guidance to water suppliers and communities about water supply and conservation. Clearly there is a demand for and interest in water conservation programs in Pennsylvania. During a recent meeting of Cooperative Extension agents from across the state, water conservation was identified as one of the most important needs for agent training and public education in the coming years.

### **Results and Benefits:**

This project provided tools and training for Extension educators to disseminate water conservation education to the citizens of Pennsylvania. Prior to this project, Extension educators were providing water-related educational programs to over 10,000 people in over 40 counties in Pennsylvania. Over 2,000 people benefited from water conservation programs or educational materials from Cooperative Extension such as home water conservation, alternative sources, and farm irrigation conservation in the past year. We anticipate that water conservation education will increase in 2004 in response to this project. The combination of professional training, background resources, publications, displays and web resources gives educators the resources they need to comfortably deliver water conservation programs across the state. Agents are also encouraged to measure the impact of their programs including number of participants and number that initiated water conservation measures. We are utilizing a web-based evaluation tool to determine the number of citizens that participated in educational programs delivered by agents and the number that initiate water conservation practices.

### **Nature, Scope and Objectives:**

This project was intended to increase public knowledge of water conservation and water use issues through education programs delivered by trained Cooperative Extension Agents using displays, publications and presentations created by this project.

### **Methods, Procedures and Facilities:**

A two-day workshop was held at the Ramada Inn in State College, PA on October 14-15, 2003. Twenty-five Extension educators from across the state attended the program. The program agenda and speakers are listed below:

#### **Agenda**

##### **Tuesday, October 14, 2003**

9:00 – 9:30 **Introduction to Drought and Water Conservation – Why Are We Here?**

*Bryan Swistock, Penn State University*

9:30 – 10:00 **Water Use and Water Budgeting in Pennsylvania** – past, present and future water use and the concept of water budgets on a watershed scale

*Bill Gast, Pennsylvania Department of Environmental Protection*

10:00 – 10:30 - **Groundwater Conservation through Green Technology** – encouraging groundwater conservation through enhanced recharge

*Al Jarrett, Penn State University, Agricultural and Biological Engineering*

10:30 – 10:45 – **Refreshment Break**

10:45 – 11:30 - **Home Water Conservation in Pennsylvania** - measures to reduce home water use, behavior versus fixture replacement, expected benefits, past studies and results.

*Dr. William Sharpe, Penn State University*

11:30 – 12:00 - **Youth Water Conservation Education** – methods and resources available for youth water conservation programs in Pennsylvania and how to get teachers involved.

*Dr. Sanford Smith, Penn State University*

12:00 – 1:00 **Buffet Lunch Provided at Ramada Inn**

1:00 – 1:45 – **Western Water Conservation I** – Residential and Landscape Water Conservation Practices in California

*Simon Eching – California Department of Water Resources, Office of Water Use Efficiency*

1:45 – 2:30 - **Landscape Water Conservation Ideas for PA** – landscaping to reduce water demands (xeroscaping) and irrigation methods to reduce water use.

*Gregg Robertson, Pennsylvania Landscape and Nursery Association*

2:30 – 2:45 – **Refreshment Break**

2:45 – 3:15 - **Institutional Water Conservation** – leak detection, plumbing retrofitting, and other institutional audits to reduce water use – an example from Elizabethtown College

*Joe Metro, Elizabethtown College*

3:15 – 4:00 – **Community Water System Leak Detection and Water Auditing** – utilizing leak detection practices and auditing procedures to identify water saving practices in community water systems.

*Don Muir, Pennsylvania Rural Water Association*

4:00 – 4:45 – **Water Saving Clothes Washers and Dishwashers - Residential Water Auditing** – new developments in dishwashers and clothes washers that save water and energy costs - determining where water is used and wasted in the home.

*Bryan Swistock, Penn State University*

5:00 PM – **Cook-out at Spring Creek Park**

Wednesday, October 15, 2003

**Wednesday, October 15, 2004**

8:00 – 8:15 **Introduction to Day Two**

*Bryan Swistock, Penn State University*

8:15 – 9:00 – **Susquehanna River Basin Commission Water Conservation and Management** – water conservation programs within the Susquehanna River Basin Commission and regulations affecting water use and conservation.

*Gil Hershel, Susquehanna River Basin Commission*

9:00 – 9:15 – **Alternative Sources of Water in an Emergency** - utilization of home gray water, capturing stormflow, rain barrels and rain gardens, miscellaneous use of swimming pool water, etc.

*Bryan Swistock, Penn State University*

9:15 – 10:00 - **Current Status of the Water Resources Planning Act** – the status of implementation of this Act, how water use will be registered, forms, water use measuring techniques, future actions under the Act

*Stu Gansell, PA Department of Environmental Protection*

10:00 – 10:15 – **Registration of Large Water Users under Act 220** – an update on the pre-registration results and the upcoming registration process for large water users under Act 220

*Dave Jostenski – PA Department of Environmental Protection*

10:15 – 10:30 – **Refreshment Break**

10:30 – 12:00 – **Panel Discussion – Inter-agency Cooperation for Water Resources**

**Education** – agency perspectives on water resources programs and how we can strengthen future cooperation. 10-minute presentations by each panel member followed by discussion.

*Cooperative Extension – Jack Watson (moderator)*

*State Conservation Commission - Karl Brown*

*PA Department of Environmental Protection – Stu Gansell and Cedric Karper*

*Natural Resources Conservation Service – Barry Frantz*

12:00 – 1:00 – **Buffet Lunch Provided at Ramada Inn**

1:00 – 1:45 - **Western Water Conservation II** – Agricultural water conservation, CIMIS technique to estimate water needs in the home and farm, water reuse and dry year preparation

*Simon Eching – California Department of Water Resources, Office of Water Use Efficiency*

1:45 – 2:15 **Community Water Re-use** –explanation of the beneficial reuse project in State College as an example of re-use technology.

*Cory Miller, University Area Joint Authority*

2:15 – 3:15 – **Disseminating Water Conservation Education in PA – Where Do We Go**

**From Here?** – Discussion of existing and planned programs, downlinks, publications, displays and other resources that can be used to provide water conservation and water use education in Pennsylvania.

*Jim Weaver and Bryan Swistock, Penn State University*

3:15 – **Evaluation and adjourn**

Each attendee received a 2” binder with relevant publications and written background related to each of the presentations. A new water conservation publication was created for use by the trained educators. This eight-page publication is entitled “Household Water Conservation”. It was added to several other fact sheets already in existence related to water conservation. 5,000 copies of this publication were printed for use by Extension educators.

Ten vinyl tabletop displays were designed and created for use by Extension educators during water conservation or other programs. These displays are often used during county fairs, Farm Show, Ag. Progress Days, and other county events to publicize Extension programs and resources. One display was delivered to each of the eight Extension regions in Pennsylvania. Two additional displays are housed at University Park for use by educators.

A water conservation web page was developed and added to the existing water resources Extension site to serve as a clearinghouse for available resources related to water conservation. Various fact sheets and information about the publication and display created from this project were added to the web page. A PowerPoint presentation was also created and linked on the web page for use by Extension educators during water conservation programs. This web page is available at:

<http://www.sfr.cas.psu.edu/water/water%20conservation.htm>

### **Principal Findings and Significance:**

Evaluations were completed by the 25 Extension educators that attended the October workshop. Thirty-two percent rated the program as “excellent”, 63% rated it as “very good” and 5% rated it as “good”. No attendees rated the program below “good”. The water conservation publications and table-top displays have only recently been delivered to the attendees so impacts to the citizens of Pennsylvania will begin to occur during 2004. So far in 2004, over 400 visits have been documented to the water conservation web site.

### **Students Supported:**

Three graduate students were supported by this project including:

1. Jennifer Sidleck, M.S., Environmental Pollution Control
2. Lindsey Donaldson, M.S., Forestry
3. Kate Schmidt, M.F.R., Forestry

### **Presentations and Other Information Transfer Activities:**

A picture of one of the ten table-top displays distributed to the Cooperative Extension regions is shown below.

## Why Conserve?

- Lower your water and energy bills.
- Reduce load to septic or sewer systems.
- Conserve your water supply.



## Normal Indoor Water Use

Gallons per day per person

Toilet	18.5
Washer	15.0
Shower	11.6
Faucets	10.9
Leaks	9.5
Bath	1.2
Dishwasher	1.0
Other	1.6
<b>Total</b>	<b>69.3</b>

## Take Care of Your Share Household Water Conservation

### Low-Flush Toilet



Conventional Toilet =  
4 gallons per flush (gpf)  
Water-Saving Toilet =  
1.6 gpf  
Savings =  
2.4 gpf or about 12.2  
gallons per day per  
person

**How to  
Save...**

### Low-Volume Showerhead



Conventional Showerhead =  
3 gallons per minute (gpm)  
Low-Volume Showerhead =  
2.5 gpm  
Savings =  
0.5 gpm or about 2.6 gallons  
per day per person

### Water-Efficient Dishwasher



Conventional Dishwasher =  
11 gallons per load (gpl)  
Water-Efficient Dishwasher =  
7 gpl  
Savings =  
4 gpl or about 0.4 gallons  
per day per person

### Low-Volume Faucet



Conventional Faucet =  
3 gallons per minute (gpm)  
Low-Volume Faucet =  
1.5 gpm  
Savings =  
1.5 gpm or about 6 gallons  
per day per person

### Front-Loading Washer



Conventional Top-Loading Washer =  
51 gallons per load (gpl)  
Front-Loading Washer =  
27 gpl  
Savings =  
24 gpl or about 8.9 gallons per day per person

**Start  
Today!**

### Low-Cost Ways to Save



Fix leaking toilets  
and faucets...  
One drip per second  
wastes up to 10  
gallons in a day!

Change some water use habits, too!

- Take shorter showers.
- Flush toilets less often.
- Wait for full loads before using the clothes washer or dishwasher.
- Collect hot runoff for outside watering.

## Add Up the Savings

Replacing traditional appliances with the water saving devices illustrated here can save you...

- 30 gallons per day per person
- 11,000 gallons per year per person
- More than 44,000 gallons per year for a family of four



## It Pays!

Replacing traditional appliances with the water-saving devices shown here can save your family money...

- About \$200 per year in reduced energy
- About \$250 per year in reduced water costs



Cooperative Extension  
Provided by the State University of Pennsylvania

**Awards:**  
None